

REMARKS

Applicant has carefully studied the outstanding Office Action. The present Amendment is intended to be fully responsive to all points of rejection raised by the Examiner and is believed to place the application in condition for allowance. Favorable reconsideration and allowance of the application is respectfully requested.

Claims 2-5, 8-12, 14-16, 18-22, 24, and 27-51 are presently pending in the application. Claims 8, 9, 30, and 32-36 have been amended and claims 42-51 have been added to further define Applicant's invention. Applicant asserts the amendments to the claims add no new matter. Attached hereto is a marked-up version of the changes made to the claims by the current amendment. The attached page is captioned "Version With Markings to Show Changes Made".

CLAIM REJECTIONS UNDER 35 U.S.C. §103

The Examiner has rejected claims 2-5, 8-12, 14-16, 18-22 and 27-41 as being unpatentable over U.S. Patent 5,594,652 to Penn et al. (Penn) in view of U.S. Patent 5,965,079 to Manners (Manners). Applicant respectfully traverses the rejection of claims 2-5, 8-12, 14-16, 18-22 and 27-41 as being unpatentable over Penn in view of Manners. Applicant asserts that neither Penn nor Manners, alone or in combination, teach or suggest Applicant's currently pending claims 2-5, 8-12, 14-16, 18-22 and 27-41.

Amended independent claim 30, requires, *inter alia*,

dispensing a first photopolymer and a second photopolymer from at least one printing head, said first photopolymer and said second photopolymer being different; and

combining said first and second photopolymers in a variably selectable proportion to produce a third material.

Amended independent claim 34, requires, *inter alia*,

... dispensers connected to said at least one printing head for dispensing at least first and second photopolymers respectively, said first photopolymer and said second photopolymer being different; and
a controller ... to cause said at least one printing head to dispense said first and second photopolymers so that said first and second photopolymers are combined in a variably selectable proportion to produce a third material.

Amended independent claim 36, requires, *inter alia*,

a plurality of dispensers connected to said at least one printing head for dispensing a plurality of different photopolymers, each photopolymer having a different color; and

a controller connected to said at least one printing head for combining said plurality of photopolymers in selectable proportions to produce a third material.

The Examiner asserts that Penn discloses dispensing two photopolymer materials. Office Action at page 2. Applicant respectfully submits that Penn does not teach dispensing two different or a plurality of different photopolymers, as variously required by each of Applicant's independent claims 30, 34 and 36, as amended.

Penn does refer to dispensing of two different materials, (see Penn reference numerals 25 and 35), but Penn does not teach that these materials are *both* photopolymers. On the contrary, the two materials as taught by Penn are always described as being different *types* of material, and where one material used is a photopolymer, the other material should not a photopolymer. For example: "A wide range of material 25, 35 combinations are possible such as water and wax, wax and plastic, plastic and metal," Penn col. 10, ll. 30-32.

Penn in fact contraindicates the use of two materials where *both* are photopolymers. For example: "[i]n the case where object material 25 is a cured photopolymer, a wax having a solubility different than that of cured photopolymer may be used as support material 35", Penn col. 10, ll. 37-39. Further, Penn prefers that the second material not be a photopolymer, "water soluble material 35...is preferred over the support materials used with other systems...such as powders... or UV-curable resin". Col. 7, ll. 60-63. Thus, Penn prefers that "UV-curable resin" (e.g., photopolymer) not be used as the second material. Penn indicates that materials 25 and 35 should in fact preferably be different types of materials, as "... dissimilar properties of the mold [made of second material 35] and object [made of first material 25] are exploited to remove the mold without affecting the object". Col. 8, ll. 13-14. Thus Penn teaches away from both materials being photopolymers.

Thus, Penn lacks at least the element of, and in fact teaches away from the element of, and expresses no need for, dispensing two (or a plurality of, with respect

to claim 36) different photopolymers, as required by each of Applicant's amended independent claims 30, 34 and 36.

The Examiner notes that that Penn does not disclose combining two photopolymers in a variably selectable proportion to produce a third material, but asserts that Manners discloses this limitation. Applicant asserts that Manners does not teach or suggest the limitation of combining two (or a plurality, with respect to claim 36) of different photopolymers, or the limitation of producing a third material, each as required by each of Applicant's amended independent claims 30, 34 and 36.

Manners does not teach or suggest one method or device using more than one polymer material. Thus, Manners inherently cannot teach or suggest combining more than one photopolymer, and cannot teach or suggest producing a third material. Manners refers in general to layers which "may be composed of photopolymer resin", but provides no reference or teaching to more than one type of photopolymer material being used in constructing a layer, no reference or teaching of combining different kinds of photopolymers to produce a third material. The Examiner cites to col. 1, ll. 20-25 in Manners. This section discusses laying down materials in layers, and discusses different suggested materials, but *does not discuss different materials being used in the same object or at the same time*. This section does not discuss using more than one material, and does not discuss combining different materials. Further, Manners provides no motivation and has no need to use more than one photopolymer material.

An obviousness rejection requires a teaching or a suggestion by the relied upon prior art of all the elements of a claim (M.P.E.P. §2142). Since neither Penn nor Manners, alone or in combination, teach or suggest at least the above discussed elements of Applicant's claims 30, 34 and 36, the combination of Penn and Manners cannot be said to obviate any of Applicant's claims 30, 34 and 36.

Further, separate from whether Penn and/or Manners teach the elements of Applicant's claims, it would be improper to combine Penn and Manners. As discussed above, neither Manners nor Penn suggest a motivation or need for combining two different materials into a third material. Penn provides a system for providing separate materials for support and build structures, respectively, and thus has no need for a system where different materials may be combined to form either

support and/or build structures. Furthermore, Penn does not use a release layer, as do some embodiments of Applicant's present invention. Therefore, Penn has no need for combining two materials. Assuming (and Applicant disagrees with this proposition) that Manners does teach such combining, it would be improper to combine the two references, as Penn does not express a need for combining two materials.

The Examiner asserts, on page 3 of the Office Action, that "it would have been obvious at the time the invention was made ... to modify the teachings of Penn with the teachings of Manners because such modification would provide many photopolymers exist [sic] whose photospeed (rate of transformation from liquid to solid) upon radiation is fast enough to make them practical model building materials." Applicant respectfully asserts that, given the teachings of Penn and Manners, this is not a reason to combine Penn and Manners. Neither Penn nor Manners express any need for a different type of photopolymer other than those used in the respective references. Neither Penn nor Manners express any need for photopolymers curing faster than taught in each respective reference.

Furthermore, in certain embodiments of Applicant's invention, the combination of two photopolymers actually *slows down* the rate of curing. Thus, the Examiner's reason for combining the references teaches away from certain embodiments of Applicant's invention. Further, the purpose of the combining in Applicant's claims is not to provide a photopolymer with any particular curing rate.

Since each of dependent claims 2-5, 8-12, 14-16, 18-22, 24, 27-29, 31-33, 35, and 37-41 depend from, directly or indirectly, one of independent claims 30, 34 and 36, and therefore include, *inter alia*, all limitations of one of claims 30, 34 and 36, dependent claims 2-5, 8-12, 14-16, 18-22, 24, 27-29, 31-33, 35, and 37-41 are also allowable.

Therefore, Applicant respectfully requests that the Examiner withdraw the rejection of claims 2-5, 8-12, 14-16, 18-22 and 27-41 as being unpatentable over Penn in view of Manners.

NEW CLAIMS

Applicant has added new dependent claims 42-51 to further define what Applicant regards as his invention. Each of dependent claims 41-51 depends from,

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directly or indirectly, one of independent claims 30 and 34, and therefore includes, *inter alia*, all limitations of one of claims 30 and 34. Thus, new dependent claims 41-50 are likewise allowable.

CONCLUSION

Based on the foregoing, Applicant believes the application is now in condition for allowance.

Should the Examiner have any question or comment as to the form, content or entry of this Communication, the Examiner is requested to contact the undersigned at the telephone number below. Similarly, if there are any further issues yet to be resolved to advance the prosecution of this application to issue, the Examiner is requested to telephone the undersigned counsel.

Please charge the \$90 due for the 10 new dependent claims 42-52 (\$9 small entity fee x 10 claims) and any additional fees associated with this paper to Deposit Account No. 05-0649.

Respectfully submitted,



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